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TECHNOLOGY DEPT.

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • NOVEMBER 25, 1944



Flowing Tunnel

See Page 344

A SCIENCE SERVICE PUBLICATION

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## PHYSICS

# Atomic Research

Nobelists describe their work in exploring the powerful nuclear forces and other fundamental questions of atomic physics.

By DR. ISIDOR I. RABI

Columbia University  
Nobelist in Physics, 1944

➤ JUST AS a century ago we were studying electrical and magnetic forces which culminated in great electrical and electronic industries, but could not foretell that fact with certainty, now these immensely more powerful nuclear forces may be turned to the advantage of mankind.

My work was directed toward investigating the magnetic and electric properties of the atomic nucleus. The purpose was to gain further knowledge of the nature of the forces that hold the nucleus together and contribute to atomic energy. In the course of these investigations my colleagues and I developed the "molecular beam magnetic resonance methods" which employed the effect of radio waves on beams of atoms and molecules. This method was a million times more sensitive than anything (*Turn to page 340*)

By DR. OTTO STERN

Carnegie Institute of Technology  
Nobelist in Physics, 1943

➤ FINDING that the magnetic moment of the proton was two and one-half times the value expected from the theory is fundamentally important because of the character of the proton as an elementary particle.

The molecular-ray method is much more sensitive than any other known methods for the determination of magnetic moments of atoms or molecules.

The method of molecular rays consists in preparing a stream of molecules by means of a system of fine slits. All molecules travel in the same direction in a highly evacuated apparatus.

Experiments with these molecular rays contribute to the solution of fundamental questions in atomic physics. Three examples may be mentioned: direct experimental proof for the space quantization of atoms by splitting a molecular ray of silver atoms in two beams in a

magnetic field; experimental proof of de Broglie's theory that moving particles show wave properties by diffracting a molecular ray of helium or hydrogen molecules at a crystal lattice, and measurement of the magnetic moment of the proton by magnetic deflection of a beam of hydrogen molecules.

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## CHEMISTRY

## New Household Fly Spray To Be Available After War

➤ AN ODORLESS, nonirritating household fly spray for postwar use in homes and restaurants has been developed by W. F. Barthel, H. L. Haller and F. B. LaForge, chemists of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

Used in the aerosol "bomb" developed by the Department of Agriculture for use by the armed forces against mosquitoes, the new fly spray promises to be an effective postwar weapon against flies, roaches, bedbugs, ants, mosquitoes, house spiders, silverfish, chiggers, carpet beetle larvae, dog ticks and dog fleas. It will be suitable for use in homes, restaurants, airplanes and any place where people congregate.

The spray is made from the powerful insect-killer, pyrethrum, purified by a new method to eliminate the odor and the irritating impurities which in the past have been the cause of irritating rashes or hay fever symptoms in some pyrethrum spray users. The method involves the use of a new solvent, nitromethane, for removing practically pure pyrethrins from the impure petroleum extract of pyrethrum flowers.

The new process produces not only a much more concentrated and powerful insect poison but one in a form called "ideal" for use in the Freon-aerosol bomb. This bomb or aerosol sprayer is a small handy can dispenser that holds a liquefied gas such as Freon which is now used in household refrigerators. When a valve is opened this aerosol dispenser emits a foglike spray of poisonous droplets so tiny that they kill more insects than ordinary coarse sprays.

While not yet available for civilian sale, Agriculture Department officials state, more than 13 million of these Freon-aerosol "bombs" have been supplied to the armed forces for use against disease-carrying insects. As a result of such extensive use, this kind of aerosol spray dispenser has been thoroughly tested.

*Science News Letter, November 25, 1944*



NOBELISTS IN PHYSICS—Dr. Otto Stern (left), was awarded the 1943 Nobel prize in physics and Dr. Isidor I. Rabi received the 1944 award, both for atomic research.



## PSYCHOLOGY

# Job Important to Health

When a worker appears to be neurotic it may be because he is underplaced or overplaced; the difficulties should be analyzed to get at the real source of trouble.

► WHEN A worker is more concerned with trying to "be" something than with any effort to "do" anything on his job, even though he may not himself be aware of this, it may be because he is neurotic, or it may be because it is impossible for him to meet the demands of his job, Dr. Bruno Solby, of the U. S. Public Health Service, told the meeting of the National Committee for Mental Hygiene, held in New York.

In the course of growing up, Dr. Solby said, every individual goes through a period in childhood when personal affection and admiration are all-important. A little boy or girl wants to please, and mother's or father's approval is all-important.

In the next state, when the individual gets out of the home and begins to join gangs, fraternities, sororities and other social circles, the "role" becomes of top importance. Then it is important to "belong." In school and college, students pick out what they want to "be" when they graduate.

But, once out of school and in a job, the measure of a man's mental health is in terms of what he can do rather than who he is or whether he is the favorite of the boss.

The unhappy employee, Dr. Solby said, nearly always blames the trouble on not being able to get along with some individual on the job. He complains that "the boss doesn't like me," or that the other employees "are prejudiced against me." This is a reaction pattern which points back to the days when it was necessary to be mother's pet or take an apple to the teacher. But although personal friction is most often blamed, this complaint can't be trusted as the real explanation of the difficulty, Dr. Solby indicated.

More often, he said, the worker is living in the second state of development—the stage where role was all-important. For some, this role stage was never outgrown. Maybe the worker is a girl who had decided to be an actress. She still thinks of herself as a great actress; it is not unnatural that she should fall down on her job as a secretary.

Others go back to a role previously outgrown because of frustration from being

either "overplaced" or "underplaced" on the job. The underplaced person may be a bright young man or woman with great abilities but without the necessary experience or training to fill the job they ought to have. The overplaced include those who "dress the part" and talk glibly enough to impress an interviewer favorably, but who do not have the mental ability to fill adequately the jobs that they get in this manner.

Both overplaced and underplaced workers may be anxious and sleepless. They do not see the real cause of their troubles, but always blame friction with some other person on the job.

The task of the industrial psychiatrist, Dr. Solby said, is to analyze the difficulties of such employees to get at the real source of the trouble. He must distinguish between those who are really neurotic and cannot outgrow the role they have unconsciously assumed and those who have similar symptoms but who are suffering only from faulty job placement.

"It is the responsibility of personnel management, supervisor and industrial psychiatrist," he said: "to cooperate in fostering the mental health of the adult population through scientific job placement."

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## From Page 339

previously known.

Chief results of this work were the very precise measurements of the amount of spin and magnetism of a number of atomic nuclei, including the proton and the deuteron (the nucleus of heavy hydrogen). In addition it was discovered that the deuteron is shaped like a football spinning on its long axis. This fact has important consequences concerning the properties of nuclear forces.

*Science News Letter, November 25, 1944*

## CHEMISTRY

## Hundred-Octane Gasoline To Be Produced in Curacao

► HUNDRED-OCTANE gasoline for United Nations bombers and fighter planes will be made on the spot in the oil-producing area of the Netherlands

West Indies centering near Curacao. The Curacao Petroleum Industry's great refinery has just completed the construction of several new installations, with the aid of engineers and contractors from the United States. Among them is a three-tower plant for the production of cumene, a synthetic substance important in the compounding of high-octane aviation fuel. This plant is now undergoing test runs.

The Curacao Petroleum Industry has instituted a new school for on-the-job training of technical personnel.

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## MEDICINE

# Whole Blood for Pacific

Wounded men on hospital ships in the mid-Pacific can now have transfusions of whole blood shipped from the West Coast in lightweight refrigerators.

► **WOUNDED** men on hospital ships in the mid-Pacific and in the Philippines can now have transfusions of whole blood as a result of new methods developed to keep the blood fresh in its long journey from the West Coast, the Navy Department has announced.

The whole blood will be flown daily by the Naval Air Transport Service from San Francisco to Pearl Harbor and then on to island bases close to the fighting fronts.

Air shipment of whole blood from donors in the United States to wounded in the European theater started late in August. For the much longer flights across the Pacific and into tropical temperatures, however, special methods of refrigeration had to be developed.

Whole blood must be stored at temperatures between 40 and 50 degrees Fahrenheit from the time it is taken from a donor at the Red Cross donor station until it is used. Mechanical refrigeration in planes could not be depended on because electricity cannot be generated while planes are grounded.

Using plywood, aluminum and modern lightweight insulation material, a portable and inexpensive refrigerator was developed at the Naval Medical Research Institute at Bethesda, Md. With 19 pounds of water ice in a cylinder which can be reloaded or changed easily, this type of refrigerator holds the proper temperature for over 60 hours. Each one carries 24 one-pint bottles of whole blood.

Besides the new type of refrigeration, a method of prolonging the "life" of whole blood was developed. Until recently, whole blood could not be used safely longer than one week after it had been taken from the donor. This period has been extended to 21 days by means of the Loutit-Mollison or "ACD" solution, consisting of citric acid, sodium citrate and dextrose.

Dried blood plasma can be kept in good condition for years and is a great life-saver in the immediate treatment of casualties. In the case of serious wounds where there has been a great and rapid loss of blood, however, plasma alone will not suffice. Whole blood transfusions are essential to provide adequate oxygen-carrying capacity to the blood.

American Red Cross donor centers in San Francisco, Oakland and Los Angeles have been called on to supply a total of 300 pints a day of "O" type whole blood for the air shipments with the understanding that the amount would be increased and the project extended. "O" type is used for this purpose because it can be given to all casualties regardless of their own blood type.

*Science News Letter, November 25, 1944*

## CHEMISTRY

## Explosive in Rockets Is More Powerful than TNT

► **A SMALL** quantity of the explosive now carried in American rockets will blow a two-inch hole through five feet of reinforced concrete, states Maj. Gen. L. H. Campbell, Jr., Chief of Ordnance,

in a report (*Army Ordnance*, Nov.-Dec.). Called "pentolite," the new explosive is 20% more powerful than TNT.

Pentolite is made by nitrating an alcohol which, in turn, is made by treating a mixture of formaldehyde and acetaldehyde with lime. It can be heated to a point below the boiling point of water and poured into artillery shells used for demolition work. It is also used as a booster, detonator, or filler in various other kinds of projectiles, including rifle grenades and antitank projectiles. It was employed to help clear the wrecked harbor of Cherbourg, France, Gen. Campbell reports.

Grandfather of Pentolite is PETN, or pentaerythritol tetranitrate, which was invented in 1891. Alone, PETN is 40% more powerful than TNT. Experiments conducted at Picatinny Arsenal at Dover, N. J., during World War I led experts to believe that PETN was too dangerous to manufacture because of its sensitivity to friction. However, by mixing the high-explosive PETN with the less-explosive TNT, they were able to produce safely a superexplosive, not as powerful as PETN, but more powerful than TNT.

*Science News Letter, November 25, 1944*



**ADDS TO AIR SAFETY**—This camera system provides a scientific method of determining the required runway lengths by recording and analyzing take-off and landing characteristics of airplanes (See SNL, Nov. 18, p. 325). In actual practice, the wind indicator unit would be located near the runway, while the camera would be located 1500 feet away from the runway.

## MEDICINE

# Typhus Control Praised

Checking of the epidemic in Naples is called one of the most outstanding achievements of modern preventive medicine; DDT and vaccine chiefly responsible.

► THE CONTROL of the typhus fever epidemic in Naples early this year "is regarded as one of the most outstanding achievements of modern preventive medicine," Brig. Gen. Stanhope Bayne-Jones, deputy chief of the preventive medicine service in the Office of the Surgeon General, U. S. Army, and director of the United States of America Typhus Commission, declared at the meeting of the National Academy of Sciences.

"At devastated Naples in 1943," he related, "typhus began to spread in an environment that contained all the elements which from ancient times have favored typhus, namely, war, undernourishment, crowding, disorganized services, lack of the means for keeping

clean, and a non-immune population with a high degree of infestation with lice.

"In this setting the ancient pestilence associated with war and human misery was attacked successfully by new weapons which were largely the product of wartime research and by militarized preventive medicine."

The new weapons were the vaccine used by U. S. Forces, new insecticides, chiefly DDT, and new methods of applying DDT powder to destroy lice.

The vaccine is a suspension of killed typhus fever germs which had been cultivated in the yolk sac of embryonated chicken eggs.

"The U. S. Army experience with this vaccine and field studies carried out by the U. S. Public Health Service and the U. S. A. Typhus Commission clearly show," Gen. Bayne-Jones stated, "that proper administration of this vaccine probably protects against infection, greatly modifies and ameliorates the disease if and when it occurs in a vaccinated person and appears to prevent death from typhus.

"There have been fewer than 50 cases of louse-borne typhus in American soldiers vaccinated against typhus and no deaths. A similar, but not identical result has come from studies of the efficacy of the vaccine in civilians in certain countries abroad."

DDT in the form of 10% powder in porophyllite kills lice in from two to six hours. While it does not kill louse eggs, it persists in clothing and kills the young insects as soon as they emerge from the hatched eggs. It persists as an insecticide for at least a month and can be dusted into clothing by hand- or power-driven dusters. Persons can be deloused with their clothes on, making unnecessary the cumbersome establishments for undressing and dressing, bathing and steam sterilization of clothing familiar to veterans of the last war. Thousands can be deloused by a few persons and in the same time and with far less effort than a few hundreds could have been before the discovery of the properties of DDT and how to use it.

About 40 cases of typhus a day were

developing in Naples among civilians near the peak of the epidemic, with a death rate varying from 4% to 54%, depending on the age of the patients. Up to the end of May, 1944, there had been approximately 2,000 cases in the civilian population, but at most two cases in military personnel.

The epidemic phase was definitely over within a month after thorough operation of modern control methods, Gen. Bayne-Jones reported. The control program consisted of seven main divisions. Of these the essential starting point and guide was finding of cases and isolating them in their homes or hospitals under a "protective sprinkling" of DDT louse powder to cut off infection at the source. Delousing of intimate and remote contacts of patients both in buildings and air raid shelters seems, according to the charts of the epidemic, to have turned the tide, although mass delousing was later done, as was immunization with typhus vaccine of a few thousand essential civilian personnel.

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## Shock Treatment Revision

► THE TREATMENT of shock in the burned and wounded will undergo "some radical revision" when scientists have learned more about the fundamental mechanisms involved, Dr. C. N. H. Long, of Yale University, predicted at the meeting.

At present it is far easier to prevent than to treat shock, Dr. Long pointed out. The plasma or whole blood transfusions which the layman thinks of as treatment for shock are really preventive measures, he explained. They are given to prevent shock and the damage associated with it from becoming irreversible and fatal.

One of the most important features of shock is that it is associated with a marked reduction in circulating blood, he said. This may occur either through bleeding from severed blood vessels or through "white hemorrhage" of plasma into the tissues after burns or injuries. When the circulating blood volume is reduced in these ways, the amount of oxygen reaching the tissues per unit of time is also reduced.

The time angle is important, Dr. Long stressed. Some tissues, such as muscles, can get along without oxygen for longer periods than others. But while the microscopic cells of the body are struggling along with a depleted oxygen supply, they are undergoing such damage that



**"LIQUID LIGHT"**—Is being applied to these 100-watt fluorescent lamps at the Fairmont Works of the Westinghouse Lamp Division by an automatic machine which coats, drains and heat-dries in one operation. Previously each step was done separately. From the tank in the foreground, the phosphor mix, from which the liquid is made, is forced through three tubes at a time. By varying the proportions of phosphors, eight different colors, ranging from daylight to pastel red, can be produced.



when more oxygen is finally supplied through blood transfusion, the cells may not be able to assimilate it. Or, if they can assimilate the oxygen, they will no longer be able to use it for the chemical transformations on which our lives depend.

Lack of oxygen, Dr. Long declared quoting an earlier physiologist, "not only stops the machinery but wrecks it."

Important and established measures for preventing these irreversible changes in shock, he said, are: Prompt use of whole blood, plasma or albumen for early relief of the decreased blood volume and flow and hence decreased oxy-

gen supply; replenishment of lost fluid and salt by judicious use of saline solutions; relief of fixed acid acidosis by use of sodium bicarbonate or lactate.

Changes in action of the adrenal glands and in biochemical reactions involving enzyme systems related to certain vitamins have led scientists to suggest as additional measures in shock treatment the use of adrenal cortical hormones, the use of vitamin mixtures and the use of chemicals that have undergone part of the change they would normally undergo in individual cells of various body organs. The value of these measures has not yet been proved.

*Science News Letter, November 25, 1944*

#### CONSERVATION

## Wood Production Massive

Simply in the gross tonnage produced in the world each year, wood ranks second only to coal; new uses are constantly being discovered.

► WOOD'S importance in the world was stressed by a group of speakers at the autumn meeting of the American Philosophical Society held in Philadelphia. Simply in the gross tonnage produced in the world every year, wood ranks second only to coal, Dr. W. C. Lowdermilk, assistant chief of the U. S. Soil Conservation Service, told the meeting. The world's annual cut of wood is estimated at 1.2 billion tons; coal mined in the same period amounts to 1.3 billion tons. And coal was wood once, Dr. Lowdermilk reminded his hearers.

Unlike coal, oil and all other things dug out of the earth, wood is a replaceable resource, the speaker continued. Under intelligent management, new crops of wood can be grown as fast as existing wood is harvested. Furthermore, while a forest is growing it confers great benefits on the community that fosters it, in soil erosion control, in flood amelioration, and in a score of other ways.

*Science News Letter, November 25, 1944*

## Water Regulation

► THE ROLE of the living forest as a regulator of the regional water supply was given particular attention in the address by Dr. Rafael Zon, retired director of the Lake States Forest Experiment Station at St. Paul. The tree canopy, he pointed out, breaks the violence of the rain, and the spongy litter of the forest floor absorbs water for gradual release

later, besides keeping open the pores of the soil.

The forest, Dr. Zon continued, abates both summer heat and winter cold, re-

duces wind velocity and decreases evaporation from the soil. At the same time, growing trees transpire much water through their leaves, enriching the humidity of the air over forests.

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## Lumber Reduction

► SOME RESTRICTION in American lumber production will probably be necessary after the war, in the interests of good long-range forest policy, Edward I. Kotek, assistant chief of the U. S. Forest Service, declared. The assumption that we can safely exceed our present war-accelerated cut of timber he declared fallacious.

This restriction need not be permanent, however, if we take the saving stitch in time, the speaker indicated: "In the long run, America's forests have high potential capacity, if real forest management is undertaken with dispatch, and surpluses for export will be available, either as primary products or converted material."

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Nylon rope, used to pick up and tow gliders behind airplanes, can stretch nearly a third without breaking.



**DEADLY WEAPONS**—The rocket launcher assembly line of the Firestone Tire and Rubber Co. at Akron, Ohio, is turning out thousands of these new war-winners. Completed launchers in the foreground are ready for packing and delivery to the fighting forces.

AERONAUTICS

## Jet-Propelled Plane Tested in Wind Tunnel

See Front Cover

► THE JET-PROPELLED plane, shown on the front cover of this SCIENCE NEWS LETTER, is being tested by NACA at Langley Field, Va. Engineers at the control panel of a full-scale wind tunnel expose the airplane to 250-mile-an-hour hurricanes generated by six 40-foot propellers, each driven by a 6,000-horsepower motor.

From studies made in NACA wind tunnels have come many conspicuous improvements in aircraft. Among the most important is a new type of high-speed cowlings for radial aircooled engines that makes possible a great increase in the airplane's speed, and at the same time greatly improves the ability of the cowlings to resist compressibility effects. A method has been worked out for milling off the heads of rivets flush with the surface of the wing with such exactness and smoothness that there is no hampering wind turbulence created. Not only is the wing smoother, but the new riveting method increases the structural strength by assuring tighter fitting rivets.

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GENERAL SCIENCE

## Six Awards Presented By the National Academy

► "BACKLOGGED" because the war prevented the meetings at which they might have been presented, half-a-dozen gold medals awarded by the National Academy of Sciences have been given to six men eminent in the fields of the life sciences and geology, at the first sessions held by that organization since Pearl Harbor. There were three awards of the Daniel Giraud Elliot gold medal and certificate, which is given in recognition of an outstanding publication in zoology or paleontology; likewise three awards of the Mary Clark Thompson gold medal, which goes annually to some outstanding worker in geology and paleontology.

Recipients of the Elliot medal are: Prof. Malcolm R. Irwin, University of Wisconsin (for 1938); Prof. John H. Northrop, Rockefeller Institute for Medical Research (for 1939), and Prof. William Berryman Scott, of Princeton University (for 1940).

The Thompson medal was awarded to: Prof. Edward W. Berry of the Johns Hopkins University (for 1942), Dr.

George Gaylord Simpson of the American Museum of Natural History (for 1943), and Prof. William J. Arkel of Oxford University (for 1944).

A seventh honor, the Ordnance Distinguished Service Award, was conferred upon a veteran officer of the U. S. Army, Maj. Gen. G. M. Barnes, chief of Research and Development Service, Office of the Chief of Ordnance, long distinguished for work that has contributed greatly towards the commanding superiority in weapons and munitions now enjoyed by American forces in the field.

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CHEMISTRY

## Steatite Goes to War, Used as an Insulator

► STEATITE, the mineral twin-sister to ordinary face powder and after-shave talc, has gone to war against the Axis, baked into intricate forms and shaped for use as insulators in electronic communications equipment, the War Department reports.

Within the past year a new manufacturing process has been perfected that permits the non-metallic mineral to be baked as a ceramic into intricate forms and shapes, some of them so tiny as to seem almost microscopic. Tubes of baked steatite can be made as thin as an ordinary shingle-nail, yet are capable of having a thinner wire inserted. These tubes can be bent at the sharpest angles, yet are hard and enduring, and cannot be injured by acids or intense heat.

Both talcum powder and steatite are known to science as kaolin talc, and both come from the same mineral, which is itself called steatite, or popularly soapstone. Its powers of resistance to heat, acids, and the attacks of the elements are remarkable in a mineral which is so soft in its natural state within the earth that it can be worked by hand like putty. All of the many varieties of steatite are extremely soft and "soapy." Most of them harden quickly, however, when exposed to air.

A chief source of raw steatite of the type needed for insulating electrical equipment is the Italian island of Sardinia. When Italy attacked France in June, 1940, the supply was abruptly cut off. Fortunately, supplies of steatite sufficient to meet immediate needs were developed in Alabama, North Carolina, and Virginia. When Sardinia was retaken by the Allied armies in mid-September, 1943, one of the first shipments from it to this country consisted of kaolin talc.

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# IN SCIENCE

MEDICINE

## Sisters Born at Same Time, But Are Not Twins

► BIRTH of baby sisters who are not twins though they have the same birthday and who developed in separate wombs in their mother's body—a rare if not completely unique occurrence—has taken place at the Philadelphia Lying-In Unit of the Pennsylvania Hospital, the same institution where quadruplets were born a few days previously.

The sisters were delivered on Nov. 7 by a Cesarean operation performed by Dr. F. Sidney Dunne of Philadelphia before a hastily assembled audience of physicians, obstetricians and nurses.

One sister, a full-term baby, weighed slightly over seven pounds. The other, one month premature, weighed just over five pounds. Both babies and mother are doing well.

The mother, a schoolteacher and former patient of Dr. Dunne's, came to Philadelphia from her home in Canada to have Dr. Dunne deliver her baby. Neither she nor the obstetrician knew there would be two babies, although Dr. Dunne knew some unusual condition was present.

She had been endowed with two separate wombs or uteri and a complete double birth canal. Although rare, this condition has been encountered before and some women with it have had babies. The particularly unusual feature in this case was the development of a living, healthy baby in each uterus. Usually, if not always, a woman with double uteri will have a baby develop in one but not both.

As remarkable as the births of these sisters and the quadruplets, famous for being the only quads on record born by a Cesarean operation, was the birth at the same hospital of a baby that developed in its mother's ovary instead of the womb. About 40 such cases have been reported in medical literature, but this is believed to be the only one in which the baby lived. The physician in this case was Dr. Roy W. Mohler.

All these unusual occurrences took place in the Lying-In Unit of the oldest hospital in the United States, Pennsylvania Hospital, established in 1751 with its cornerstone laid by Benjamin Franklin.

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# THE FIELDS

## MEDICINE

### Anti-Malaria Vaccine Successful in Animals

► **SUCCESSFUL** vaccination of animals against malaria, a feat until recently believed impossible, has been achieved by Dr. Jules Freund, of the Public Health Research Institute of the City of New York, David M. Heyman, president of the Institute, announced in a report.

Whether the technique Dr. Freund has developed will be successful in protecting humans against malaria is still a question. Investigators at the Institute and the Department of Health are now working on the problem of application of the method to humans.

The chief obstacle, one which has hampered efforts to find new and better drugs for treating malaria, is the fact that the malaria germs, or parasites as they are called, which attack humans do not attack other animals. Man, monkeys and birds are the only animals in whose bodies malaria parasites will grow and produce sickness, but monkey malaria, bird malaria and human malaria are caused by different kinds of parasites. Scientists have recently found one strain of monkey malaria parasites which will grow in humans, but none of the human strains will grow in monkeys.

More than once scientists have developed chemicals which were effective in curing malaria in monkeys but which failed utterly when tried in human cases. Encouraging as the development of an anti-malaria vaccine for monkeys is, scientists therefore hardly dare to hope that the new technique will succeed in humans.

*Science News Letter, November 25, 1944*

## PSYCHOLOGY

### Ear Plugs Cut Absenteeism Among B-29 Workers

► **AN ABRUPT** drop in absenteeism was the unexpected result of supplying workers riveting the wings on B-29 bombers with ear plugs of new type, designed to prevent deafness from excessive noise, Dr. Hallowell Davis, of Harvard Medical School, reported at the meeting of the Industrial Hygiene Foundation, held in Pittsburgh.

The ear plugs, known as V-51R plugs, have until very recently been made ex-

clusively for Navy gunners and Army artillerymen. Within the last few weeks samples have been released to some plants producing aircraft. They "represent a real advance," Dr. Davis said. They attenuate noise by 30 decibels or more, which is enough to bring the extreme noises of present industrial situations down to the probably harmless level of 100 decibels. This is equivalent to the noise of a subway express passing through a local station, he explained.

The abrupt drop in absenteeism following issuance of these plugs to the riveters has obvious implications, Dr. Davis pointed out.

High-level noise such as they were exposed to may and probably will cause deafness after long-term exposure to it. Regardless of this effect, however, noise may be sufficiently tiring, annoying and distressing to contribute to a high rate of absenteeism in spite of patriotic and financial motives for staying on the job.

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## CHEMISTRY

### Activated Carbon From Steam-Exploded Wood

► **ACTIVATED** carbon, used in gas masks, sugar-refinery filters and a hundred other key chemical spots, is produced by a new steam-explosion process from wood chips and similar waste materials, on which U. S. patent 2,362,463 has just been issued to R. M. Boehm and H. E. Hall of Laurel, Miss.

The wood is prepared for final carbonization by a process resembling that used in the preparation of wood fibers for manufacture into wallboard by the Masonite Corporation, assignee of rights in the new patent. That is, the wood chips are subjected to high steam pressure in a sealed cylinder, and the pressure then suddenly released. Only in the present process the pressure is carried to a higher point—up to 1,000 pounds per square inch.

This is maintained for a relatively short period, usually from 30 seconds to five minutes. When the pressure is released, the disintegration of the fibrous wood structure is complete; what comes out of the cylinder is a dark mass of doughy consistency. This, the inventors state, can be compressed into briquets under high pressure without the addition of any syrupy or tarry binder. Instead of expanding, and possibly cracking, during the further heating to produce carbonization and activation, the briquets actually contract and become denser.

*Science News Letter, November 25, 1944*

## ENGINEERING

### Design for Truck Cabs Solves Problem of Repairs

► **A UNIQUE** design for truck cabs, of the type wherein the driver sits directly over the engine, is the subject of patent 2,362,453, taken out by D. L. Cosper of Auburn, Ind., and assigned to the International Harvester Company. It solves the problem of how to get at the engine for adjustments and repairs very neatly: the floor boards and steering wheel are lifted out, and then the whole cab tilts sideways when a crank is turned.

*Science News Letter, November 25, 1944*

## ORNITHOLOGY

### Finding Swifts in Peru Solves Migration Mystery

► **ANOTHER** mystery of nature can be checked off the unsolved list, with the discovery in Peru of chimney swifts wearing bands that had been put on their legs in the United States. Dr. Frederick C. Lincoln, in charge of studies on bird migration conducted by the U. S. Fish and Wildlife Service, describes the find as "one of the most important ornithological discoveries in the last two decades." It closes the last gap in scientific knowledge of where North American birds go for the winter.

Although nearly 375,000 swifts have been tagged with identifying bands during the past 10 years, in this country and southern Canada, it was not until Indians in the Yanayaco river valley in Peru shot some of them that any of the bands were ever recovered. These bands were returned to Washington through the American Embassy at Lima, and were checked against the official bird-banding lists. The bands had been placed on the birds over a wide area, including localities in Illinois, Connecticut, Alabama, Tennessee, Georgia and Ontario.

So sudden and complete is the migrating swift's disappearance that the ancient Greeks imagined that the birds dived into ponds and hibernated in the mud at their bottom. This curious notion survived through the Middle Ages and even had some currency in comparatively recent times.

The chimney-dwelling habits of the swift represent an adaptation to modern, man-made conditions of the birds' age-old preference for hollow trees as rookeries. Many of them still inhabit hollow trees; flocks comprising thousands of individuals often take shelter within a single tall tree or unused chimney.

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## ASTRONOMY

# Venus Now Easily Visible

Saturn and Jupiter are also seen during December, but Venus far exceeds any other in brightness, and you will see it first in the western sky as dusk falls.

By JAMES STOKLEY

► **THOUGH** it doesn't quite manage to get on the accompanying maps, the planet Venus is now easily visible in the evenings. It stands in the constellation of Capricornus, the sea-goat. This group is just to the west of Aquarius, which is shown. By the times for which the maps are drawn (11:00 p.m. on Dec. 1 and 10:00 p.m. Dec. 15) this group has set. But, for about three hours after the sun goes down, Venus is visible. It is so bright, of magnitude minus 3.6, that it far exceeds any other star or planet, and if you watch the western sky as dusk falls you will see it long before any other appears. The evening of Dec. 18 brings an interesting sight, for at 7:00 p.m., EWT, Venus will stand very close to the crescent moon and we will have a real counterpart of the star and crescent insignia.

The only planet shown on the maps is Saturn, in the constellation of Gemini, the twins, seen high in the east. Just at present this famous planet remains visible all night. Of magnitude minus 0.2, it is brighter than any star with the exception of Sirius, the dog star.

Sirius is seen in the southeast, and its brilliance on the astronomical scale (which happens to be so arranged that very bright objects are indicated by a negative number, less than zero) is minus 1.6. Actually, however, Sirius is not an extremely bright star, it only looks brighter than some because it is one of the closest to us.

## Jupiter Same Size

The third planet which is seen during December nights happens to be equal in magnitude to Sirius. This is Jupiter, appearing in the early morning hours, about 1:00 a.m. Its steady glow, however, is quite different from the scintillations of a star, even one so bright as Sirius.

Just above Sirius, these evenings, is Orion, the warrior, with brilliant Betelgeuse and Bellatrix. Above and a little to the left of Sirius is Procyon, part of Canis Minor, the little dog. Canis Major, of which Sirius is part, is the great dog.

Going above Orion we come to Taurus, the bull, containing the reddish star Aldebaran. Moving to the left from Orion we find Gemini, the twins, in which Saturn stands, as well as their permanent occupant, the first magnitude star Pollux. Castor, the other twin, is a little fainter—of second magnitude.

Above Gemini is Auriga, the charioteer, with Capella. This also is of first magnitude, and there are two other stars of this same brightness shown. One, however, seen near the northwestern horizon, is Vega, in Lyra, the lyre. It is so low that atmospheric absorption makes it seem a lot fainter than if it were higher in the sky. The same is true, to a less extent, of the other, which is Deneb, in Cygnus the Swan, above Vega. Earlier in the evening, of course, these stars will be better placed, and will shine more brilliantly.

## Winter Begins

When the sun reaches its farthest south position in the sky on Dec. 21 at 7:15 p.m., EWT, we say that winter commences, also that this is the shortest day of the year. This is correct in one sense, if by day we refer to the time between sunrise and sunset. On Dec. 21, at 40 degrees north latitude, and on the central meridian of any of the time belts, the sun rises at 8:18 a.m., war time, and sets at 5:38 p.m. In any time zone sunrise and sunset would be earlier to the east of the standard meridian (75th for

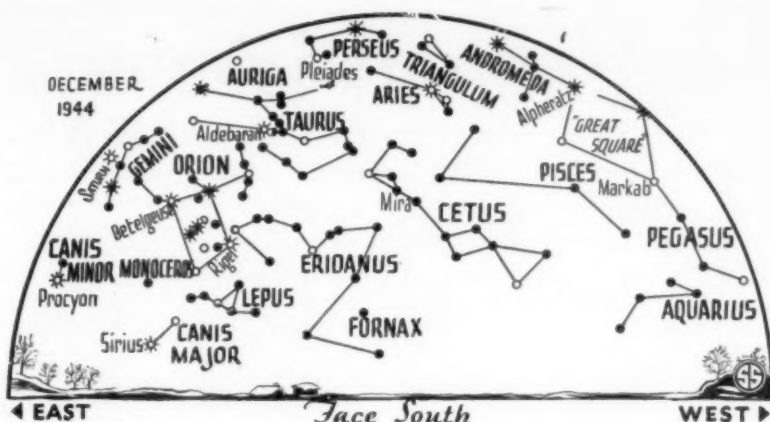
Eastern, 90th for Central, 105th for Mountain and 120th for Pacific time). West of these longitudes it would be later, since the apparent movement of the sun across the sky is from east to west. Thus the duration of daylight, at 40 degrees north latitude is only 9 hours 20 minutes on Dec. 21.

## Six Hours Difference

In contrast, on June 21, the beginning of the past summer, the duration of daylight was 15 hours 1 minute. Sunrise was then at 5:31 a.m., and sunset at 8:32 p.m. The reason for this difference is the changing position of the sun in the sky. In June it was well to the north; it rose north of the east point and set north of the west point of the horizon. That meant that it had a long path across the sky. But this month, with the sun far south, it rises south of east and sets south of west. Its daily path is much shorter and so it is below the horizon much longer than it is above.

But we also use the word day to mean the time from noon to noon, including both daylight and darkness. In this sense, the days just before Christmas are the longest, not the shortest, of the year if we measure by the sun. At this time of year it takes the sun about 30 seconds longer than its average time to get from one noon day position to the next. About the tenth of September, on the other hand, the time it took the sun to get from the meridian around to it again was about 21 seconds less than average. The reason for this is found partly in the fact that the earth's motion around the sun is not exactly circular, but we are closer in January than in July.





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SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Actually, however, we do not use sun time, and it would be inconvenient to make clocks that had to run slower in December than September, so they are based on the mean and 24 hours of clock time is equal to the average time the sun takes to go around. The result of this is that at some times of year the sun reaches the meridian a number of minutes before noon, and at other dates it is late getting there. We call the difference between the two the "equation of time," and sundials are often provided with means for determining this, so that your watch can be adjusted from observations of the sun.

#### Celestial Time Table for December

Dec.	EWI	
2	3:57 a.m.	Moon passes close to Saturn
4	10:00 p.m.	Mercury farthest east of sun
7	10:57 a.m.	Moon in last quarter
8	3:31 a.m.	Moon passes Jupiter
	6:00 p.m.	Moon farthest, 251,400 miles
12	2:45 a.m.	Algal at minimum
		Meteors of Geminid shower
14	3:56 p.m.	Moon passes Mars
	11:34 p.m.	Algal at minimum
15	10:34 a.m.	New moon
17	8:23 p.m.	Algal at minimum
18	8:00 p.m.	Moon passes Venus
20	5:13 p.m.	Algal at minimum
21	7:15 p.m.	Winter commences
22	11:54 a.m.	Moon in first quarter
23	8:00 a.m.	Moon nearest, 230,000 miles
28	11:00 p.m.	Saturn nearest, 747,500,000 miles
29	9:44 a.m.	Moon passes close to Saturn
	10:38 a.m.	Full moon

Subtract one hour for CWT, two hours for MWT, and three for PWT.

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#### MEDICINE

## Routine Transfusion

► THE AMOUNT of blood a patient loses during an operation is almost always more than the surgeon expects or than he estimates during the operation, Dr. Frederick A. Coller, Dr. Clarence E. Crook and Dr. Vivian Iob, of the University of Michigan Medical School, report (*Journal, American Medical Association*).

Average blood loss during removal of an appendix is 13 cubic centimeters, or slightly over one-third of an ounce. It is about six times that for a hernia operation. Largest average blood loss they give is the 1,084 cubic centimeters, approximately a quart, for brain operations.

Even the least blood loss retards convalescence, they believe, and all loss over 10 ounces in healthy adults should be replaced.

It is not practical for the surgeon to measure the exact blood loss during an operation at the time. The amount on sponges, dressings, gloves and instru-

ments must all be taken into account for accurate measurements. So the Michigan doctors suggest relying on a knowledge of average blood losses as given in medical reports.

With this as a guide, the surgeon can arrange in advance for a blood transfusion instead of having to make the arrangements and give the transfusion after the patient has gone into shock from the loss of blood.

"The patient is benefited most," they conclude, "when the blood loss is replaced by blood, given as the loss occurs."

The report of the Michigan scientists is based on studies by other scientists as well as their own.

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A variation of 50 degrees in the temperature within 24 hours is considered drastic on the earth, but the change on the moon may be eight times as great.

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## Do You Know?

At least 10 types of *nylon* are fabricated, each with different properties.

*Water vapor* may condense as clouds, fog, rain, snow, sleet, hail, dew, or frost.

*Paint making* has increased in Mexico, which has now 22 paint-manufacturing plants of considerable size.

The smallest *monkeys* in the world are 'South American marmosets; a fully grown pair can sit in the palm of a person's hand without crowding.

The *orange blossom oil* in fine perfumes is from the oil of the bitter orange blossom called *neroli*, grown principally in Europe.

*Ethyl alcohol*, a basic organic raw material, is used in larger quantities in making synthetic rubber than in all other uses added together.

Additional *carbon tetrachloride* is now available for dry cleaning purposes, as military needs no longer require the entire output.

*Paper* made from bamboo may become common because of a new process discovered in the United States; bamboo grows in tropical America as much as 18 feet a year and matures in four years, so an unlimited supply may be produced.

Gardeners may now buy walnut-sized cases of *mantis eggs* which they hang on bushes near the garden to hatch; the mantis destroys large numbers of other insects, harmful varieties, as they constitute the sole food of this beneficial insect.

### MATHEMATICS DICTIONARY

Invaluable in reading any book that uses mathematics.

#### The James Mathematics Dictionary

The only such book now published, provides standard definitions of the terms and phrases from arithmetic through elementary differential equations, the technical terms ordinarily used in the applications of these subjects, and more advanced basic terms. Easy examples, many illustrations and all sorts of formulas are included. The appendix contains tables of weights and measures, a list of mathematical symbols and tables ordinarily used in handbooks.

This dictionary is a great deal more than a collection of definitions. It explains, illustrates and correlates, stressing especially those operations that are hardest to understand. One reader has called it "Ten texts in one." Second printing of Revised Edition, just off the press. Blue fabric-bound binding, for \$3.00, from the Digest Press, Van Nuys, California, or Science News Letter.

### PHYSIOLOGY

## Third Nervous System

Pilots have to develop new physiology to include instruments and controls; redesign of cockpits urged for greater safety.

► REDESIGN of airplane cockpits, which in effect constitute a third nervous system for the pilot, was called for by Dr. Eugene F. DuBois, professor of physiology in Cornell Medical College, at the meeting of the National Academy of Sciences, held in Washington.

Modern flying, he pointed out, has made it necessary for the pilot to develop a new physiology. In addition to the central nervous system, of which the brain is a part, and the peripheral nervous system which conducts pain or other sensations to the brain or spinal cord, the pilot has developed an outside nervous system consisting of the instruments and controls.

"In the haste of development, the cockpit has been assembled with relatively little regard for the principles of human anatomy, physiology and psychology," Dr. DuBois declared. "Although the engineers and manufacturers have done a surprisingly good job, the time has come for a redesign, simplification and standardization of the cockpit. Instruments and controls can be improved and coordinated.

"The plane can be made much safer by better placement or elimination of sharp structural members or instruments that may be struck by the head in crashes even at moderate speeds.

"The most important aspect is standardization of the positions and actions of the instruments and controls so that a pilot is not confused when flying a new plane. What would happen to a pianist if there were 20 different sizes and arrangements of the piano keyboard?"

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### Body's Vitamin Factories

► NEW STANDARDS for the amounts of vitamins required in the daily diet and for the amounts of foods needed to supply them may come from discoveries of vitamin factories in the body, it appears from the report of Prof. C. A. Elvehjem of the University of Wisconsin.

These internal vitamin factories are operated by bacteria inhabiting the intestinal tract. Scientists a generation or more ago saw the possibility of the intestinal bacteria being related to health and length of life but the discoveries of their

role in synthesizing certain vitamins have been made within recent years.

Vitamin synthesis by intestinal bacteria apparently varies in different species of animals. It is impossible, Prof. Elvehjem said, to predict from studies with one species of animal, such as rats or dogs, that other species, such as chickens, monkeys or man, will be found to have the same kind of synthesis.

Bacterial vitamin synthesis also varies, at least in some animal species studied, according to the type of diet exclusive of its vitamin content. In rats, for example, synthesis of riboflavin, one of the B vitamins, is decreased by the presence of fat in the diet. Even the type of fat affects production of the vitamin by intestinal bacteria. The discovery that both thiamin (vitamin B<sub>1</sub>) and riboflavin are produced in the intestinal tract of man was made in experiments in which the diet was high in rather pure carbohydrate, Prof. Elvehjem pointed out.

"The effect may be quite different in the human living on a typical mixed diet," he said. "In fact, we now have preliminary results which indicate that this is true."

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### CHEMISTRY

## Toluene May Be Nitrated Without Sulfuric Acid

► A METHOD for nitrating toluene without the use of sulfuric acid, is covered by patent 2,362,743, obtained by Willard de C. Crater of Newark, Del.

Toluene becomes trinitrotoluene in three steps or stages, passing through phases mono- and di-nitrotoluene on the way. In Mr. Crater's process, the first step is accomplished by the addition of 70% nitric acid, after which the excess acid and water are removed. Then it is converted into dinitrotoluene by treatment with 98% nitric acid. Excess acid and water are again removed in a vacuum still, the crude product further washed, and finally dissolved in alcohol. After a final distilling to remove the alcohol, the refined crystals of dinitrotoluene are ready for nitration into TNT.

Science News Letter, November 25, 1944

ANTHROPOLOGY

# NATURE RAMBLINGS

by Frank Thone



## Partial Suicide

▶ ISN'T IT ODD, how human beings enjoy poisoning themselves!

Not all the way, of course. There's no fun in being dead; and the final stages of dying do not seem to be very enjoyable, either. But slight poisonings, that dull the senses, impair mental and muscular coordination, release conventional inhibitions and in general give a holiday from the strain of acting like a human being, seem to be welcomed by a very large proportion of the human race. Drugging one's self into a temporary escape from one's troubles is, psychologically speaking, a mild form of partial suicide, differing from the drastic last resort of the actual self-murderer mainly in degree—and also in the important fact that the process is a reversible one.

Ever since Noah's misadventure with the grape-juice that was left standing too long and got spoiled, with scandalous results, ethyl alcohol has been the most widely used of these intoxicating drugs—though it is far from being the only one. This is probably due mainly to the fact that it is the easiest to produce—indeed, it produces itself even by inadvertence or accident, whenever any sugar-containing liquid is exposed to the chance fall of air-borne yeasts. Or (as in Noah's case aforementioned) the yeasts are already clinging to the skins of the grapes or other fruit, ready to begin working as soon as the juice has been squeezed out.

Another factor in favor of alcohol (if anything can be said to be in its favor) is its relative mildness. Except when concentrated from the natural fermented products by distilling (a quite recent sophistication) it takes an appreciable time to act; and unless the consumer is more than making a hog of himself the

after-effects, though perhaps extremely disagreeable, are not likely to be fatal. This cannot be said for most other drugs used for the purpose of intentional intoxication.

Whatever may be the cause or causes, alcoholic beverages were practically world-wide in their use even before the great geographic expansion of the hard-drinking white race 500 years ago. The only really considerable "dry" areas on the world map in pre-Columbian days were North America above the Rio Grande and the islands of the Pacific.

Other social intoxicants have been limited geographically in their original distribution, primarily because of the limited range of the plants that produce

them. Tobacco is strictly American, and so is coca, source of cocaine; opium is of Asia, hemp (as hasheesh or bhang) started in India and has only lately been spreading in North America as marihuana. There are also drugs that appeal only to race-limited tastes, as betel to the Malays and peyote to certain American Indian groups. All round, there seem to have been very few peoples, even in more primitive times, who didn't have some favorite form of "dope".

*Science News Letter, November 25, 1944*

Recent investigations of American sumac as a source of tannin shows that poor soils grow sumac of higher tannin content than do fertile soils.



## "I hear the war's practically over... back home!"

PROBABLY it's only natural for us here at home to feel that the war's almost won, the way the good news has been pouring in.

But the war's not over for *him*—not by a long sight! And he's just one of a few million or more that will stay over there until they finish the bloody mess. Or kill time for a few months—or years—in some hospital.

What about you?

This is no time to relax. No time to forget the unfinished business. It's still

your war, and it *still* costs a lot.

So dig down deep this time. Dig down till it hurts, and get yourself a hundred-dollar War Bond over and above any you now own—or are now purchasing. This 6th War Loan is every bit as important to our complete and final Victory as was the first.

Don't "let George do it"—get *yourself* that added bond for the sake of the guys that can *still* be killed. After all, you're safe and sound and *home*. That's worth another hundred-dollar bond, isn't it?

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# Books of the Week

DIVING, CUTTING AND WELDING IN UNDERWATER SALVAGE OPERATIONS—Frank E. Thompson, Jr.—*Cornell Maritime*, 214 p., illus., \$2.

EUROPE, AN ATLAS OF HUMAN GEOGRAPHY—Marthe Rajchman—*Morrow*, 120 p., illus., \$2. The physical aspects of Europe, its resources, industries, populations, country characteristics, an aid to understanding present day news and future problems.

THE NAVAHO DOOR, an Introduction to

Navaho Life—Alexander H. Leighton and Dorothea C. Leighton—*Harvard Univ. Press*, 149 p., illus., \$4.

PSYCHOANALYSIS TODAY—Sandor Lorand, ed.—*International Univ. Press*, 404 p., \$6.

SOUL OF AMBER, the Background of Electrical Science—Alfred Still—*Murray Hill Books, Inc.*, 274 p., \$2.50.

THE TECHNOLOGICAL OUTLOOK IN PACKAGING—*American Management Assn.*, 39 p., paper, 75c, (Packaging Series No. 12).

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stability, increase the resistance to cracking at high temperatures, and oiliness or extreme pressure.

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## Oils Behave Differently

► CRANKCASE oils having the same physical and chemical characteristics often behave so differently in an engine that mechanical laboratories now quite generally use internal combustion engines as laboratory tools to make performance tests, Norman C. Penfold of the Armour Research Foundation stated at the National Fuels and Lubricants meeting of the Society of Automotive Engineers.

The use of engines as a means of determining the performance of crankcase oils probably had its inception shortly after the advent of the internal combustion engine, he said, but only within the last 10 years have engines installed in mechanical laboratories had widespread application. Just as engines had been found to be the most satisfactory apparatus for rating gasolines, he continued, so engines have been found to be the most satisfactory apparatus for rating oils.

Both gasoline and diesel engines, of many different types, are used in testing laboratories. Production engines as test engines have a common fault, the speaker stated, which centers about the frequent production changes which alter the engine as a laboratory apparatus. Engines to be constructed for lubricant evaluations research work should have incorporated a larger amount of control and measurement apparatus, so that the vital engine features affecting the lubricant may be adjusted and measured.

Control of the flow rate of oil through the various circuits of the engine and measurement of the amount of heat absorbed in the more important portions of the circuit, he continued, should be helpful in obtaining greater reproducibility in engine test results and in understanding differences between engines and in making the engine a more valuable research tool.

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Many Europeans consider corn a fit food only for livestock.

More than 10% of the coal used in American homes is wasted, it is estimated, largely because of dirty and faulty furnaces.

## ENGINEERING

# Warning for Motorists

Passenger car owners are urged to take adequate precautions against the tendency of heavy-duty oils to loosen sludge deposits.

► PASSENGER car owners who frequently use different types or brands of oil with almost every oil addition or re-fill are faced with the potential danger of sudden loosening of soft sludges and deposits when heavy-duty oils are first added to dirty engines, Carl W. Georgi, technical director of the research laboratories of the Quaker State Oil Refining Corporation, told the Society of Automotive Engineers, meeting in Tulsa, Okla.

The sudden loosening action of heavy-duty oils on certain types of sludges involves a serious hazard if adequate precautions are not taken, Mr. Georgi stated. The loosening of considerable amounts of sludges in badly fouled engines can readily cause plugging of oil pump intakes and disruption of oil circulation. Serious engine damage can then

result if the condition is not noted soon enough.

He pointed out that heavy-duty oils will help keep clean engines in a clean condition for a maximum period of operation, but they are not intended to be used as cleaning or purging agents for dirty engines. The only thorough and safe means of cleaning a badly fouled engine is by disassembly and overhaul, he added.

*Science News Letter*, November 25, 1944

## Highly Specialized

► LUBRICANTS of the years ahead will be carefully formulated and highly specialized, W. Andrew Wright, development engineer of the Sun Oil Company, told the meeting.

"While undoubtedly there will be still important techniques developed in the field of refining, much of the load will be borne by specialized addition agents," Mr. Wright remarked.

These specialized addition agents are chemical compounds not normally present in the refined oil which give the lubricant certain physical properties not possessed by the oil or improve upon those already present. By the use of addition agents, the life of the oil may be greatly extended, as well as the useful life and mechanical condition of the operating equipment, he stated.

Among the practical functions of these addition agents to be used in specialized lubricants are the control of the viscosity of lubricants, control of corrosion-causing properties through oxidation

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# • New Machines and Gadgets •

✿ **DUCK DECOY**, that flies in the air instead of floating on the water, is a bird-shaped rubber balloon complete with wings. Filled with any suitable lighter-than-air gas, it is kept from escaping by a long cord extending from the hunter's duck blind. The wind, or jerks on the cord, keep the rubber bird in motion.

Science News Letter, November 25, 1944

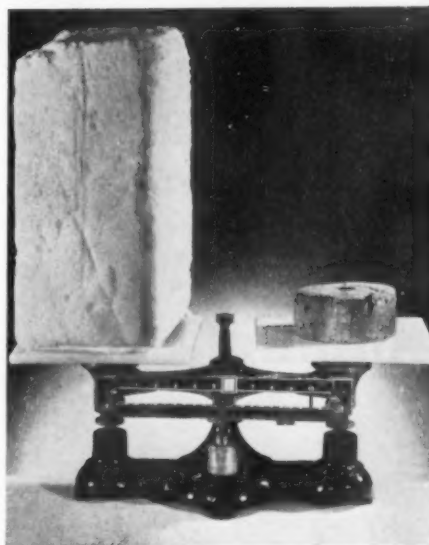
✿ **PORTABLE** machine, to re-align .50-caliber cartridges in metallic link belts for use in airplane machine guns, is operated by hand at the front where electric power is not available. The loaded links are fed in one end and come out the other with every cartridge jarred out of line in shipment put back in place.

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✿ **CLOTHES** hanger, adjustable for wide-shouldered garments, resembles the ordinary wire hanger but has at each end of the frame a U-shaped wire extension with sleeved ends which can be moved on the frame. When pulled out, these lengthen the frame by several inches.

Science News Letter, November 25, 1944

✿ **PLASTIC** foam is made from a combination of synthetic plastic materials which are first foamed and then solidified. The result is a semi-rigid, buoyant solid about one-seventh the weight of



cork, as shown in the picture. It is used for insulating.

Science News Letter, November 25, 1944

✿ **PARKING** space meters, to control two adjacent parking spaces along the curb of city streets, lessen sidewalk obstruction and cost of installation. One supporting post, placed at the junction of two spaces, has in the same housing at its top two separate coin-controlled time interval indicators, one for each space.

Science News Letter, November 25, 1944

✿ **HAIRPIN** holder and dispenser consists of a casing in which the pins are stacked and held against the top by a spring. Inside posts keep them in line. A slide in the top end, with an outer knob for the finger and an inner knob to engage the loop of the top pin, is used to push them out one at a time.

Science News Letter, November 25, 1944

✿ **LEG-ATTACHED** corn cutter is powered from a small bellows under one heel which, each time the wearer steps on it, creates pressure to operate a release lever that sets in movement a cutting blade projecting from a frame attached above the ankle. A spring gives the blade increased cutting momentum. Both hands of the farmer are left free to grasp the cornstalks.

Science News Letter, November 25, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 235.

Deer hunters are advised to use red handkerchiefs as the flash of a white one may be mistaken for a leaping deer's tail.

Cantaloups, harvested at prime ripeness, retain their flavor throughout the year if their flesh is crushed to a smooth pulp and frozen.

## Question Box

### ASTRONOMY

What three planets are now visible? p. 346.

### CHEMISTRY

How can toluene be nitrated without sulfuric acid? p. 348.

How is talc helping to win the war? p. 344.

### CONSERVATION

What product ranks second to coal in tons produced? p. 343.

### ENGINEERING

Why should precautions be taken when heavy-duty oils are used? p. 350.

### GENERAL SCIENCE

What awards were made by the National Academy of Sciences? p. 344.

### MEDICINE

How successful has the vaccinating of animals against malaria been? p. 345.

What has made it possible to fly whole blood to wounded men in the Pacific? p. 341.

What sisters, born at the same time, are not twins? p. 344.

### ORNITHOLOGY

Where do chimney swifts go for the winter? p. 345.

### PHYSICS

What does Dr. Rabi say was the purpose of his work? p. 339.

### PHYSIOLOGY

What constitutes a pilot's third nervous system? p. 348.

### PSYCHOLOGY

How is the cut in absenteeism in a B-29 factory explained? p. 345.

What may be the results of overplacing or underplacing employees? p. 340.

Where published sources are used they are cited.



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